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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/731,434

12/10/2003

Jae-hyun Kim

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09/19/2005

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EXAMINER

TUNG, KEE M

ART UNIT

PAPER NUMBER

2671

DATE MAILED: 09/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/731,434

Applicant(s)

KIM ET AL.

Examiner

Kee M. Tung

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 11 July 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-10 is/are allowed.
- 6) ☒ Claim(s) 11-16 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

The response filed 7/11/05 has been considered in preparing this Office action.

#### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 11-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Park et al (6,791,558 hereinafter "Park") in view of Hussain (6,801,203).

Park teaches a method of accelerating 3D graphics (Figs. 1 and 4) comprising pixel rasterization pipeline (12-15 and 17); a memory section (11) includes a texture cache section (21) and a pixel cache section (22) includes a Z-data section and a color data section; a flag memory section (16) and an external memory, such as frame memory for reading Z-data and color data into the pixel cache (22) and texture cache (21); and reading Z-data from Z-cache (pixel cache 22); performing a predetermined z-test on the z-data (first depth operation section 12); and reading the color data from the color cache (pixel cache 22) and performing a predetermined coloring processing on the color data (color operation 17 after passed the first z-test operation 12; abstract and Fig. 1), when the result of z-test is determined to be success. However, Park fails to explicitly teach or suggest the pixel cache (22) includes two separate caches and the data read from external memory into the caches at the same time. This is what Hussain

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teaches (Figs. 2, 3). Hussain teaches an efficient graphics pipeline (such as, color pipeline 240, s/z pipeline 250 and texture pipeline 260 in *parallel*, see claim 1) with a pixel cache (three separate caches, a color cache 245, s/z cache 255 and texture cache 265) and data pre-fetching (Fig. 3 and abstract). It would have been obvious to one of ordinary skill in the art at the time the present invention was made to combine the teaching of Hussain into the system of Park in order to take the best advantage of the high bandwidth of the memory system while effectively masking the latency of the memory system and delivers high throughput as taught by Hussain (abstract and col. 11, lines 3-17). Therefore, at least claim 11 would have been obvious.

As per claim 12, Park teaches the result of z-test is determined to be successful when a pixel that is being rasterized is displayed on a screen, and determined to be not successful when the pixel is hidden on the screen (first and second Z-operation sections 12 and 14).

As per claim 13, Park teaches the z-data storage unit reads z-data required from the frame memory only when the z-data required is not stored in the z-data storage unit (cache miss).

Claims 14-16 are similar in scope to claims 11-13, and thus are rejected under similar rationale.

### ***Allowable Subject Matter***

3. Claims 1-10 are allowed.

***Response to Arguments***

4. Applicant's arguments filed 7/11/05 have been fully considered but they are not persuasive.

The rejection has been modified in order to fully consider applicant's remarks. The modification of the detail rejection of claims 11-16 is based in view of applicant's argument which resulted of withdrawn the rejections of claims 1-10. Regarding claims 11-16, applicant argues that Hussain fails to teach "reading color data and performing predetermined coloring processing data to the when the result of z-test is determined to be a success." The examiner disagrees Park teaches the feature as indicated in the detail rejection above. Applicant cannot show non-obviousness by attacking references individually where, as here the rejections are based on combination of references.

Furthermore, applicant argues that Park teaches away from the combination proposed by the examiner. The examiner disagrees because Park teaches to solve the same problem solve by applicant except the two separate caches (abstract, the primary depth checking is performed before the performing of the texture mapping, and thus the unnecessary performing of texture mapping can be removed).

Therefore, applicant's arguments are not deemed to be persuasive.

***Conclusion***

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kee M. Tung whose telephone number is 571-272-7794. The examiner can normally be reached on Tuesday - Friday from 5:30 am - 4:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ulka Chauhan can be reached on 571-272-7782. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read 'K. M. Tung', with a large, sweeping flourish extending from the end.

Kee M Tung  
Primary Examiner  
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